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Development and Validation of a Smoking Expectancies Measure for Adolescents Seeking to Quit Smoking

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Abstract

Background—A more comprehensive understanding of factors that affect smoking cessation outcomes among adolescents may help enhance treatment interventions. One promising but underexplored factor that may influence cessation success is teens' specific expectancies or beliefs about smoking outcomes. The present study evaluated the validity and reliability of a new measure of expectancies and its association with cessation outcomes among 762 adolescent smokers participating in studies of the American Lung Association's Not-On-Tobacco cessation program.

Methods—Self-report questionnaires were collected prior to and following participation in a smoking cessation program. Self-reported cigarette use was verified with expired-air carbon monoxide. A multi-step exploratory and confirmatory factor analysis and reliability and validity analyses were performed.

Results—Four theoretically-related yet empirically independent factors were identified by the Smoking Expectancies Questionnaire (SEQ): 1) Positive Reinforcement, 2) Negative Reinforcement / Emotional Regulation, 3) Negative Reinforcement / Addiction and Withdrawal, and 4) Negative Outcomes/Risk. These factors could be subsumed by a single SEQ factor that reflected an overall concept of smoking expectancies relevant for adolescent smoking cessation. An overall SEQ Function score reflecting the balance between positive and negative expectancies predicted both pre-intervention cigarettes per day and cessation outcomes.

Conclusions—A single, overall SEQ Function score may prove useful for understanding the associations among individual, social and contextual factors in predicting treatment outcomes. Additionally, study findings may assist with modifying smoking expectancies among cessation program participants thereby enhancing treatment outcomes with diverse youth smoking populations.

Keywords

Adolescent smoking; cessation; expectancies; beliefs

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Introduction

Despite an increase of nearly 78 million dollars in tobacco prevention spending since 2006, teens in the United States continue to smoke at high rates; a 2012 national survey found that among adolescents aged 12–17, 22% identified as being daily smokers, with 10.6% reporting smoking 16 or more cigarettes/day (1). Although adolescent smokers express experiencing a great deal of trouble quitting (2), there are only a few evidence-based programs to assist teens seeking help (3,4). One suggestion for improving the success of youth smoking interventions has been to increase the understanding of factors that may influence treatment outcomes (3). Some moderators of cessation outcomes are well known: smoking history, smoking patterns, motivation and confidence in quitting, cessation history, beliefs and expectancies regarding outcomes, and a number of demographic variables (5–8). Whereas a great deal of literature has explored how beliefs about possible consequences of smoking may predict smoking behavior in both adult and adolescent populations (9–13), far less is known about how these beliefs may influence smoking cessation outcomes specifically.

Expectancy theory proposes that motivation to engage in certain behaviors depends on the perception that the behavior will bring about expected, positive outcomes (or avoid negative outcomes; 14). Likewise, Bandura's Social-Learning Theory suggested that an individual's behavior is based "more on what they believe than on what is objectively true" (15, p.2). With regard to the substance use, research demonstrates that the beliefs an individual has about the benefits of using substances are powerful predictors of future use (16–18). For example, smokers who had reduced expectations that smoking would reduce negative affect or boredom were more likely to quit smoking (19). Similarly, among established smokers, expectancies of positive outcomes and avoiding negative outcomes have been shown to be positively correlated with nicotine dependence (11). Whereas the literature on substance use expectancies has made important contributions to the understanding of levels of substance consumption and problematic use, expectancies do not always relate to use in predicted manners (20,21) and findings are often mixed even within a single study (22). For example, Lee and colleagues (21) found, as expected, positive expectancies predicted alcohol consumption; however, they also found that holding negative outcome expectancies was a stronger predictor of consumption than positive outcome expectancies. Similarly, it has been found that changes in certain alcohol-related expectancies does not necessarily relate to changes in consumption (23). One reason for such discrepant findings may be that some studies examine the unique contribution of positive and negative expectancies in a "head to head" manner (24) by presuming that behavior is determined by *either* positive expectancies *or* negative expectancies (i.e., positive and negative expectancies influence behavior independently, rather than interactively). Indeed, positive and negative outcomes related to substance use may operate very differently. For example, positive outcomes of substance use are often immediate (e.g., intoxication, mood elevation), and negative outcomes are often delayed (e.g., physiological illness, hangovers). Therefore, positive outcomes are often more heavily weighted, and consequently, positive expectancies are often found to have more direct influence on behavior (25). With substances like tobacco, negative outcomes are often quite delayed (e.g., cancers or other illnesses occur years down the road) as compared

to other substances; suggesting that positive expectancies (e.g., social utility, mood alteration, relief from withdrawal) may be weighted even more heavily than perceived negative outcomes in regulating smoking behaviors. It may be for such reasons that much of the expectancy literature has, until relatively recently, focused on substances other than tobacco (e.g., alcohol) which may have more immediate negative outcomes than tobacco use. Overall, the relative importance of positive and negative expectancies remains unclear (23) and how these two dimensions work together to influence smoking behaviors, particularly those related to cessation outcomes, has not yet been explored.

To date, a number of studies have developed and evaluated measures of expectancies for adolescent smoking, each including some measure of positive and negative outcome expectancies (13,26–30). Nevertheless, none of these measures has included a measure of how positive and negative expectancies work interactively. That is, previously developed measures have separate positive and negative expectancy factors and each assesses how these factors, independently, influence outcomes. Yet behavioral economic and other theories would assert that a decision to smoke or not smoke is made based on a consideration whether positive expectancies outweigh negative expectancies, suggesting an interactive effect rather than an independent effect of each. For example, the subjective expected utility (SEU; 27), suggests that individuals make decisions between competing behaviors based on an intuitive formula by which the behavior that has the greatest *subjective utility (i.e.,* the outcome which is expected to provide the maximum benefit) is selected – regardless of the objective value (or cost) of the alternative behavior. With regard to smoking, and in particular smoking cessation, this theory suggests that those individuals who continue to smoke hold more positive beliefs about the benefits of continued smoking than to the benefits of cessation. For example, if a smoker believes that continuing to smoke provides the maximum benefit because of a particular function that smoking serves in his/her life (e.g., social benefits, avoidance of physiological withdrawal), he/she will continue to smoke – even given his/her knowledge of the benefits of quitting (e.g., improved health, greater longevity, reduced financial burden). Bauman and colleagues (31) suggested that a single SEU variable “provides a comprehensive understanding” of smoking and other behaviors because it includes both positive and negative beliefs about the outcome of behavior (p. 122). A simple theoretical formula would suggest: Positive Expectancies – Negative Expectancies = Decision to smoke (or quit). Thus, if the reasons to continue smoking (positive expectancies) are greater than the reasons to stop smoking (negative expectancies), an individual will continue to smoke.

Whereas previous measures assess positive and negative expectancies, none of these measure assess issues directly related to habitual or addictive smoking behavior, such as being uncomfortable or experiencing withdrawal symptoms when not able to smoke. This may be a critical omission, especially among established smokers, as the fear of withdrawal or the loss of an established “habit” (e.g., a cigarette with coffee after breakfast) may be a strong influence on the decision to continue smoking. Additionally, no previous measure has been developed and validated specifically for adolescent smokers who are looking to quit. Research has demonstrated that treatment seeking teen smokers may be substantially different from non-treatment seeking teen smokers. For example, teen smokers seeking to

quit tend to smoke more cigarettes per day, have had more experience with cessation failure, and have had longer experience with both positive and negative experiences with smoking (e.g., 6). Additionally, for those seeking to quit smoking there are highly salient expectancies of potential negative outcomes (e.g., withdrawal discomfort). These expectations may play a more important role in the decision to smoke or quit smoking (19). Smokers who are not attempting to quit may not factor potential withdrawal discomfort into their smoking decisions at the same level.

The present study sought to explore the reliability and validity of a new measure of smoking expectancies among a sample of 762 adolescent smokers currently seeking to quit. The new measure improves upon existing measures of smoking expectancies through the inclusion of items related to addiction or habitual cigarette use, as well as an overall expectancy score which weights how positive and negative expectancies work interactively to influence smoking behavior and cessation outcomes.

Methods

Participants

Participants were 762 adolescent smokers (56% female) between the ages of 14 and 19 (M = 16.16; SD = 1.13) who voluntarily participated in matched-design, school-based studies of the American Lung Association's Not On Tobacco (N-O-T) program between 1998 and 2006 (6,32). Participants represented three states (FL, NC and WV). The majority of the participants were Caucasian (72.9%). On average, participants had been smoking over three years (M=3.32; SD = 1.80), and currently smoked 14.2 (SD=9.1) cigarettes per day. The majority (81%) had tried to quit at least once before study enrollment.

Measures

All data were collected through participant self-report. Additionally, self-reported cigarette use was verified with expired-air carbon monoxide (CO) readings>9ppm. All measures, including biochemical verification of smoking status, were administered at the time of enrollment in the cessation program ("baseline") and outcome measures were collected 3-months post-baseline following the completion of the cessation program.

Demographics—All participants completed questionnaires regarding their current age, gender, grade in school, ethnicity and current family living situation (e.g., living with biological parents, adoptive parents, a biological and step-parent).

Smoking History—Several dimensions of smoking history were assessed, including: 1) age of first cigarette use, 2) previous quit attempts, 3) level of nicotine dependence, 4) length of smoking history, and 5) frequency of cigarette use on weekdays and weekends. Each of these dimensions has been shown to be relevant in the understanding of adolescent smoking and cessation (33–37). Nicotine dependence was assessed using a seven-item revision of the original Fagerstom Tolerance Questionnaire (FTQ) developed and validated for adolescent populations (38,39).

Intervention readiness—To assess participant's overall readiness to quit smoking, a key construct supported by the literature (40–44) we assessed motivation to quit and confidence to quit. To assess motivation, we asked participants to rate, on a five point scale, how motivated they were to stop smoking (1 = not motivated; 5 = very highly motivated). To assess confidence in quitting, we asked participants to rate, on a five point scale, how confident they were that they would be able to stop smoking (1 = not confident; 5 = very highly confident).

Smoking Expectancies

The 21-Items for the smoking expectancies measure were adapted from the Program Evaluation Handbook for Smoking Cessation, developed for the Centers for Disease Control and Prevention and the Department of Health and Human Services to assist in the evaluation of smoking cessation interventions (41). The items, which were reviewed by a panel of experts in smoking cessation and evaluation, reflect a range of beliefs about smoking including smoking for pleasure, smoking for social facilitation, smoking for purposes of negative reinforcement (e.g., to prevent withdrawal or regulate affect), and beliefs about risks of smoking. Items assessing positive expectations were rated on a five-point Likert scale ranging from 1=never to 5=always. Items related to negative expectations were rated on a five-point Likert scale ranging from 1=strongly disagree to 5=strongly agree. See Table 1 for items.

Analytic Strategy

Given evidence of multiple dimensions regarding perceived consequences (both positive and negative) of smoking behavior (e.g., 13), we first conducted exploratory factor analyses (EFA) to examine the factor structure of the items included in the questionnaire. Next, in order to confirm EFA findings and further the confidence of the expectancy measure, confirmatory factor analyses (CFA) were performed. CFA results were evaluated based on criteria suggested by Schreiber and colleagues (46) and included model Chi-Square, Comparative Fix Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). To independently evaluate and confirm EFA and CFA findings, our sample of 762 was randomly split into two samples: Sample 1, N=378 (EFA) and Sample 2, N=384 (CFA). The sample size of 378 for EFA analyses exceeds even conservative recommendations of 10:1 subject to variable ratio (47). Likewise, for CFA analyses, the sample size of 384 exceeds recommendations of 5:1 subject to variable ratio (48) and recommendations based on absolute sample sizes of >100 for CFA with more than four indicators per latent factor (49). As a final step, to explore reliability and validity of the scale, the two samples were combined. All analyses were performed using SPSS version 20 software (50).

Results

Missing Data and Assumptions of Normality

Prior to analyses, data were screened for the degree of missing data, outliers and other violations of the assumption of normality of distributions. Because data were collected in person within a controlled-research study, little data were found to be missing. Fewer than 4

individuals (< .04%) were missing data on any given variable. The exception was 7.5% (n=54) missing data on the Fagerstrom Tolerance Questionnaire. Missing data analyses found no significant patterns or predictors of missingness. As a result, all missing data were imputed using multiple imputation methods (51). All variables in the current study demonstrated acceptable levels of skew and kurtosis. Preliminary analyses confirmed that there were no significant differences on any variables between the two randomly divided samples.

Exploratory Factor Analyses – Sample 1

A Factor Analysis with Promax rotation was performed on 378 subjects. Bartlett's test of sphericity ($\chi 2 = 4059.41$, $p < .001$) and the Kaiser-Meyer-Olkin measure (.85) support the factor analysis of the data. Utilizing both the examination of scree plots and Horn's parallel analysis method (52) a total of four factors, accounting for 50% of the variance, were retained. All factor loadings were between .51 and .75 with factor eigenvalues ranging from 1.53 to 2.28. See Table 1 for EFA results. The items "I smoked to prevent weight gain;" "People have more fun when they smoke;" "Parties are better when people are smoking;" and "smoking cigarettes is an effective way of keeping weight down" were dropped for having eigenvalues < 1.0. Examination of the items lead to the identification of the following factors: 1) Positive Reinforcement, 2) Negative Reinforcement – Emotional Regulation, 3) Negative Reinforcement – Addiction and Withdrawal, and 4) Negative Outcomes/Risk. Coefficient alpha for was .73 for Positive Reinforcement, .78 for Negative Reinforcement, .80 for Addiction, and .73 for Negative Outcomes/Risk. Finally, coefficient alpha for total SEQ score with all items was $\alpha = .83$.

Confirmatory Factor Analyses – Sample 2

Confirmatory factor analyses using AMOS 17 (53) and Mplus (54) were conducted to replicate the findings from the EFA. Accordingly, four latent factors were created. These factors had between four (Negative Outcomes/Risk) and seven (Negative Reinforcement – Addiction and Withdrawal) indicators each, reflecting the items on each of the factors from the EFA. To evaluate fit, we utilized TLI, CFI, and RMSEA fit indices with a general cut-off of .90 or above for TLI and CFI as indicators of good model fit, and a cut-off of .08 or less for RMSEA. A measurement model resulted in acceptable overall model fit, X^2 (124, N = 384) = 261.82, $p < .001$, TLI = .92, CFI = .94, RMSEA = .05. All indicators loaded onto their respective factors at acceptable levels, ranging from .50 to .74. Correlations between the factors, presented in Table 2, suggest that these factors are related yet independent dimensions. To determine if the four factors were related to a single, second-order factor titled "Expectancies," a second CFA was conducted. Results demonstrate that the four identified factors loaded onto the second-order Expectancies factor, and the overall model fit is acceptable, $X^2(124, N = 384) = 268.04$, $p < .001$, TLI =.90, CFI = .92, RMSEA = .055. This suggests a single factor subsumes the four individual factors and reflects an overall "Expectancies" category.

Confirmatory Factor Analysis – Full Sample

To further confirm the factor structure, the CFA was repeated using the full sample of 762 participants. Results were similar to the split-sample findings, with acceptable overall model-fit, X^2 (124, N = 762) = 444.22, p < .001, TLI = .90, CFI = .91, RMSEA = .02, and indicator loadings ranging from .50 to .78. Furthermore, the four factors loaded onto second-order Expectancies factor with acceptable loadings and overall model fit, X^2 (124, N = 762) = 465.90.82, p < .001, TLI = .90, CFI = .91, RMSEA = .02.

Reliability and validity – Full Sample

Creation of an overall Smoking Expectancies Questionnaire (SEQ) Function score. Behavioral Economics theory (30) suggests that when a smoker's expectations of positive outcomes resulting from smoking outweigh expectations of negative outcomes, there will be no change in behavior. In order to measure an individual's overall expectancies for smoking, we calculated a mean for the reason for continued smoking (i.e., positive expectancies such as Positive Reinforcement, Negative Reinforcement – Emotional Regulation and Negative Reinforcement – Addiction and Withdrawal and subtracted an inverse total for reasons for quitting smoking (i.e. negative expectancies such as Negative Outcomes/Risk). We subsequently conducted validity analyses using the SEQ Function score, with higher scores indicating a greater likelihood of continued smoking.

Reliability

To evaluate internal consistency reliability, Cronbach's alpha and split-half tests were conducted. Cronbach's alpha for the SEQ total was .83, and the split-half was .82.

Convergent Validity

The SEQ Function score was significantly correlated with the number of baseline cigarettes smoked on weekdays, $r = .29$, $p < .01$, number of baseline cigarettes smoked on weekends, $r = .32$, $p < .01$, nicotine dependence (i.e., FTQ), $r = .33$, $p < .01$, baseline carbon monoxide readings, $r = .20$, $p < .01$, and was inversely related to cessation confidence, $r = -.28$, $p < .01$, and cessation motivation, $r = -.20$, $p < .01$.

Predictive Validity

First, to determine if the SEQ Function score could contribute unique explanatory variance to the frequency of cigarette smoking at baseline above and beyond known correlates, a linear regression analysis was conducted. First, known causes and correlates of smoking frequency were entered, including current age, age of smoking onset, level of nicotine dependence, and cessation confidence and motivation, followed by the SEQ Function score. Results demonstrate the overall model was significant and explained 30% of the variance in smoking frequency at baseline, $F(6, 658) = 45.57$, $p < .001$. The SEQ Function score added significant explanatory variance to the frequency of baseline smoking, above and beyond the known causes and correlates, see Table 3.

Next, to examine the predictive validity of the SEQ Function score, we examined if the total score could predict cessation treatment outcome above and beyond other known predictors.

Because the present study was conducted as part of a controlled efficacy trial of the Not On Tobacco program versus a brief intervention, group assignment was entered into the first step of the model, followed by current age, age of smoking onset, level of nicotine dependence, and cessation confidence and motivation and finally the SEQ Function score. Results demonstrate that the SEQ Function score is a significant predictor of cessation outcomes, above and beyond the other predictors, with an odds ratio of 1.44 (see Table 4).

Discussion

Despite of the popularity of expectancy theories in human decision making and their application to health behaviors, only a handful of studies have examined their usefulness in predicting smoking cessation, particularly among adolescent populations. This study is the first to test a global view of smoking expectancies that result in a single score reflecting an individual's reasons for continued smoking versus the reasons for quitting smoking. Specifically, the Smoking Expectancies Questionnaire assesses the expectancies that smoking results in positive outcomes or negative outcomes, and how the balance of these expectancies may influence ongoing smoking behavior. Moreover, given that adolescents actively seeking to quit smoking have different smoking patterns, levels of addiction, and motivations (6), it can be theorized that these individuals hold meaningfully different expectations with regard to smoking. Thus, the Smoking Expectancy Questionnaire is uniquely suited for use among adolescents seeking or entering cessation treatment.

The new measure found four dimensions which reflect adolescents' expectancies of smoking: 1) Positive Reinforcement, 2) Negative Reinforcement – Emotional Regulation, 3) Negative Reinforcement – Addiction and Withdrawal, and 4) Negative Outcomes/Risk. The positive reinforcement factor was comprised of items related to favorable aspects of smoking: holding cigarettes, smoking for pleasure, the process of lighting a cigarette, or watching smoking being exhaled. Whereas Myers and colleagues (13) identified a positive reinforcement factor in the adolescent / young adult version of the Smoking Consequences Questionnaire (SCQ), the majority of the factor was accounted for by items relating to the taste of cigarettes: four of the factor's five items were taste-related and one item was related to the feeling of a cigarette in the mouth. The findings of the present study are more consistent with the original version of the SCQ (55) which identified several aspects of positive reinforcement beyond taste, including watching exhaled smoke and handling cigarettes. Overall, the positive reinforcement factor in the present study seems to reflect a broad range of favorable aspects of smoking experienced by adolescents beyond taste, and thus may capture a more robust picture of why adolescents are drawn to continued smoking behaviors.

Unlike previous measures, the present study found two factors relating to negative reinforcement of smoking: 1) emotional regulation and 2) addiction. Both Brandon and Baker (55) and Myers and colleagues (13) identified a single negative reinforcement factor related to smoking as a mechanism to calm and relax, to alleviate anger and to cope when upset. Similarly, the present measure identified a factor related to expectancies that smoking helps regulate negative affect (e.g., anger, stress) and enhance or facilitate positive affect (e.g., relaxation). However, the Smoking Expectancies Questionnaire includes a factor

relating to nicotine dependence or habitual smoking. We believe that negative reinforcement related to addiction is a critical factor to include; there is little doubt that continued smoking is related to a fear of withdrawal symptoms and individuals often fail at cessation attempts because of the need to alleviate withdrawal symptoms or due to the classically conditioned stimuli associated with smoking behavior.

Although previous studies have identified factors relating to expectancies that smoking leads to weight loss, the present study did not identify such a factor. Despite some evidence and conventional wisdom that teens – especially girls – may use smoking as a method of weight loss, other evidence has suggested that the relationship between smoking and body weight in young adults in less than expected (56). One study found that 85% of young smokers had never smoked as a way to control their weight (57); another study found that trying to lose weight and perceived weight failed to predict smoking behavior in multivariate models (58). Given the mixed evidence that teen girls may use smoking as a method for weight control, we believe that the absence of a weight control factor in the current measure is not detrimental and the factors included (positive reinforcement, negative reinforcement and negative consequences) capture the key expectancies salient to regular teen smokers.

Perhaps the most important finding in the present study is the utility of a single Smoking Expectancies Questionnaire (SEQ) Function score which calculates the overall perceived benefits of continued smoking by subtracting reasons *not to smoke* (e.g., potential negative consequences) from reasons *to continue smoking*. This single score was found to predict both the number of daily cigarette prior to a cessation intervention and cessation success following the intervention. Moreover, the SEQ Function score predicted these outcomes over and above other variables associated with smoking behavior and cessation success, including age of smoking onset, nicotine dependence and cessation motivation and confidence. These findings highlight the importance of considering the combined effect of positive and negative expectancies and suggest that smoking expectancies play an important role in smoking behavior and cessation success.

These findings must be considered in light of several study limitations. First, participants were teens who were sufficiently motivated to quit smoking that they joined a voluntary smoking cessation program. These participants may not be representative of the majority of adolescent smokers who are not seeking to quit smoking. Second, despite sampling from several states, the majority of participants were Caucasian resulting in little ethnic diversity among the sample. Again, this may result in a sample that is not fully representative of a more diverse population of teen smokers. Finally, the items in the SEQ were assessed using Likert scales and the resultant data reflect ordered-categorical variables. The use of such data may confound EFA and CFA analyses as they may be prone to non-normal distributions. Although all variables were screened for deviations from normality, CFA analyses were conducted using Mplus software which handles ordered-categorical variables by estimating a polychoric correlation matrix and an asymptotic covariance matrix.

In summary, these findings may have important implications for identifying and understanding the factors that affect treatment outcomes. The existence of a reliable and valid measure of smoking expectancies for treatment-seeking adolescent smokers that

incorporates both positive and negative outcomes can be used to further explore the relationships among expectancies, other individual factors, and social and contextual factors in predicting treatment outcome. This can lead to the development or modification of existing cessation programs to better influence the smoking expectancies of program participants thereby enhancing treatment outcomes with diverse populations of youth.

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Table 1

Factor Loadings and Items

Factor and Items	Communalities	(Eigenvalues) / factor loading
Factor 1: Smoking-Related Behaviors (Positive reinforcement)		**(2.28)**
1. I like holding a cigarette	.37	.70
2. The process of lighting up a cigarette is enjoyable	.45	.72
3. I smoke for pleasure	.52	.71
4. I smoke for a “lift”	.30	.56
5. Part of my smoking enjoyment is watching the smoke as I exhale	.33	.62
Factor 2: Emotional Coping (Negative reinforcement)		**(1.62)**
1. I think smoking is relaxing	.57	.57
2. I smoke when I’m angry	.42	.69
3. I smoke when I’m upset	.50	.61
4. I smoke for comfort and relaxation	.63	.69
5. I smoke when I feel “down” or worried	.44	.75
Factor 3: Addiction (Negative reinforcement)		**(4.76)**
1. When I run out of cigarettes I find it uncomfortable until I can get more	.62	.54
2. I smoke to perk myself up	.41	.57
3. I smoke automatically, without being aware of it	.34	.62
4. When I am not smoking, I am very aware of it	.25	.51
5. I chain smoke, I light a new cigarette when I still have one burning	.26	.66
6. I get a gnawing hunger for a cigarette when I haven’t smoked in a while	.62	.60
7. I’ve found a cigarette in my mouth and haven’t remembered putting it there	.25	.55
Factor 4: Consequences		**(1.53)**
1. I will have to smoke for a long time before it will hurt my health	.23	.59
2. Smoking will not hurt my health if I exercise a lot	.39	.69
3. Most teens who smoke cigarettes can stop smoking whenever they want to	.30	.72
4. I can smoke without getting hooked	.42	.71

Table 2

Correlation between study variables

	Age	CPD / Weekday	CPD / Weekend	FTQ	SEQ – Positive	SEQ – Negative	SEQ – Addiction	SEQ – Consequence	Age First Used	SEQ -- Total
Age	--									
CPD / Weekday	.08**	--								
CPD / Weekend	.07**	.65**	--							
FTQ	−.05	.47**	.46**	--						
SEQ – Positive	.07	.10**	.14**	.09*	--					
SEQ – Negative	.08*	.17**	.24**	.25**	.38**	--				
SEQ – Addiction	−.02	.33**	.35**	.45**	.40**	.50**	--			
SEQ – Consequence	.04	.10**	.08**	.11**	−.08*	.15**	.18**	--		
Age First Used	.23**	−.14**	−.14**	−.18**	−.06	−.03	−.15**	−.08**	--	
SEQ – Total	.04	.22**	.28**	.29**	.76**	.72**	.71**	−.26**	−.07*	--

Note:

* = $p < .05$;

** = $p < .01$;

CPD = Cigarettes Per Day; FTQ = Fagerstrom Tolerance Questionnaire

Table 3

Regression analysis predicting baseline cigarettes per day

Variable	*B*	*SE B*	β
Current Age	.74	.24	.11**
Age of smoking onset	−.35	.24	.11**
Nicotine Dependence (FTQ)	1.80	.14	.45***
Cessation Motivation	−.55	.33	−.07
Cessation confidence	−.08	.31	−.10
SEU Function	.40	.14	.10**
Model R^2		.30	

Note:

* = $p < .05$;

** = $p < .01$;

*** = $p < .001$

Table 4

Logistic regression predicting smoking status following treatment

Variable	*B*	*SE B*	*EXP(B)*
Treatment group	−.56	.27	.58*
Baseline Smoking	.04	.02	1.04
Baseline FTQ	.28	.08	1.32**
Baseline Cessation Confidence	.11	.17	1.12
Baseline Cessation Motivation	−.24	.17	.79
Baseline SEU Function	.17	.07	1.44*
Model R^2		.10	

Note:

* = $p < .05$;

** = $p < .01$;

*** = $p < .001$